

Design and Analysis Tools for Deployable Solar Array Systems, Phase II

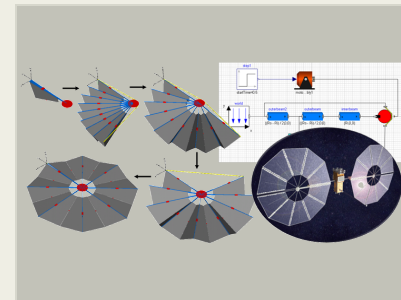
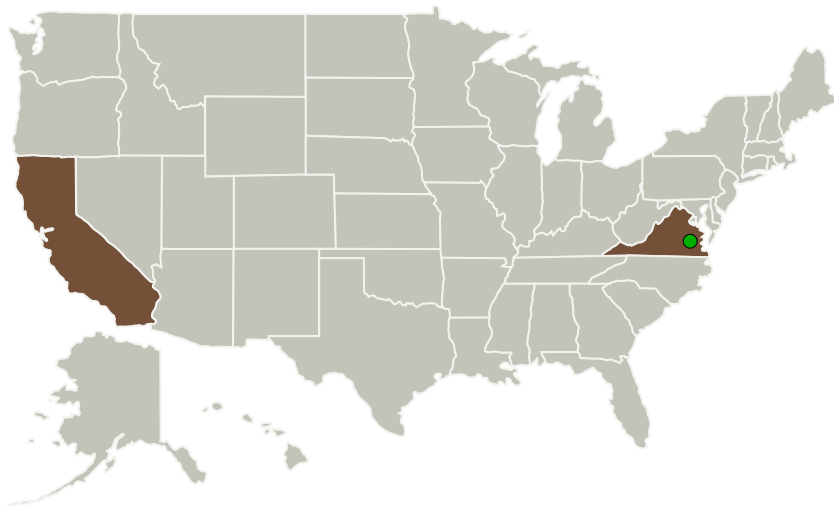
Completed Technology Project (2014 - 2016)



Project Introduction

Large, lightweight, deployable solar array structures have been identified as a key enabling technology for NASA with analysis and design of these structures being the top challenge in meeting the overall goals of the NASA Space Technology Roadmap. The use of analysis to drive design from an early stage is critical to their success, yet conflicting design requirements and demanding space constraints make traditional design/build/test methods challenging and expensive. The proposed SBIR program focuses on overcoming this through the development of a user-friendly multi-disciplinary design and analysis software toolkit that can rapidly perform parametric studies and design optimization of solar array concepts. The software package will provide a graphical user interface and analysis procedures to evaluate critical performance metrics, while eliminating the unnecessary pre-processing and computational overhead associated with current approaches. Analysis capabilities will include flexible multi-body dynamics, array deployment, modal analysis, and response simulation. Model creation will be simplified through the use of an extensible, hierarchical blockset solution and a library of blocks specific to deployable solar array analysis. The Phase II effort will focus on the development of advanced analysis and design capabilities and further validation of the tool through test-correlated modeling of a state-of-the-art solar array system.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
ATA Engineering, Inc.	Lead Organization	Industry	San Diego, California
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
California	Virginia

Project Transitions

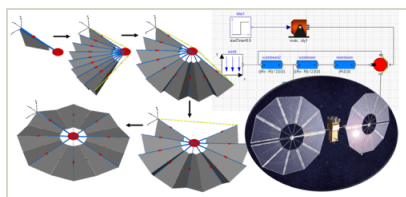
**May 2014:** Project Start**October 2016:** Closed out

Closeout Summary: Design and Analysis Tools for Deployable Solar Array Systems, Phase II Project Image

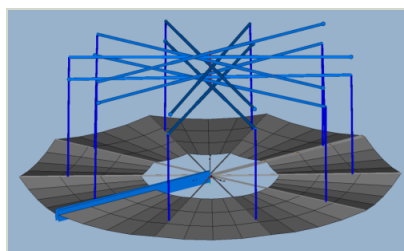
Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/137469>)

Images

**Briefing Chart Image**

Design and Analysis Tools for Deployable Solar Array Systems, Phase II
(<https://techport.nasa.gov/image/130723>)

**Final Summary Chart Image**

Design and Analysis Tools for Deployable Solar Array Systems, Phase II Project Image
(<https://techport.nasa.gov/image/129809>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

ATA Engineering, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

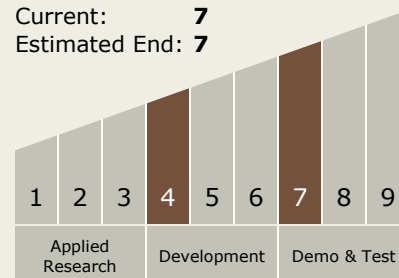
Carlos Torrez

Principal Investigator:

Cory Rupp

Technology Maturity (TRL)

Start: 4
Current: 7
Estimated End: 7



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.3 Mechanical Systems
 - └ TX12.3.3 Design and Analysis Tools and Methods

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System